DOCUMENT RESUME

ED 476 258 UD 035 146

AUTHOR	Clotfelter, Charles T.
TITLE	Are Whites Still "Fleeing"? Racial Patterns and Enrollment Shifts in Urban Public Schools, 1987-1996.
PUB DATE	2000-09-00
NOTE	59p.
AVAILABLE FROM	Duke University, Terry Sanford Institute of Public Policy, Box 90239, Durham, NC Box 90239. Tel: 919-613-7401; e-mail: info@pps.duke.edu; Web site: http://www.pubpol.duke.edu/.
PUB TYPE	Reports - Research (143)
EDRS PRICE	EDRS Price MF01/PC03 Plus Postage.
DESCRIPTORS	Black Students; Elementary Secondary Education; *Enrollment Trends; Public Schools; *Racial Composition; Racial Relations; School Desegregation; *Urban Schools; *Whites

ABSTRACT

The effect of interracial contact in public schools on the enrollment of whites has been an important concern in assessments of desegregation since the 1970s. It has been feared that "white flight," meaning exit from or avoidance of racially mixed public schools, could undermine the racial contact that desegregation policy seeks to enhance. This study examines this question using recent data. It also expands coverage from large urban districts to entire metropolitan areas, paying attention to the spatial context within which enrollment decisions are made. To do so, it examines data for 1987 and 1998 on racial composition and enrollment in all schools and school districts in 238 metropolitan areas. The study finds that white losses appear to be spurred both by interracial contact in districts where children attend school and by the opportunities available in metropolitan areas for reducing that contact. The findings apply with significant consistency to large and small districts in both large and small metropolitan areas. Implications for metropolitan segregation are examined. (Contains 34 references.) (Author/SM)

Abstract

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The effect of interracial contact in public schools on the enrollment of whites has been an important concern in assessments of desegregation since the 1970s. It has been feared that "white flight" – meaning exit from or avoidance of racially mixed public schools – could undermine the racial contact that desegregation policy seeks to enhance. This study examines this question using recent data. It also expands coverage from large urban districts to entire metropolitan areas, paying attention to the spatial context within which enrollment decisions are made. To do so, it examines data for 1987 and 1996 on racial composition and enrollment in all schools and school districts in 238 metropolitan areas. The study finds that white losses appear to be spurred both by interracial contact in districts where their children attend school and by the opportunities available in metropolitan areas for reducing that contact. These findings apply with remarkable consistency to large and small districts in both large and small metropolitan areas. Implications for metropolitan segregation are examined.

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Are Whites Still "Fleeing"? Racial Patterns and Enrollment Shifts in Urban Public Schools, 1987-1996*

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In sharp contrast to the firestorm of controversy it generated into the 1970s, school desegregation has receded from prominence as a national policy issue in the last two decades. One reason for its virtual disappearance has been the Supreme Court's clear resolve to place limits on aggressive efforts to achieve and maintain racial balance in public schools.[1] Yet school desegregation survives as national policy, and most of the issues that surrounded its implementation in the 1960s remain important today. In particular, racial contact in schools may affect such things as the level and distribution of academic achievement in the population, racial attitudes, subsequent social and economic outcomes of students, and patterns of residential integration.[2] The last of these became a prominent issue during the 1970s, when some observers warned that "white flight" from desegregating schools might resegregate schools over time by increasing the racial disparities among districts.

The aim of this paper is to examine recent changes in the racial composition and enrollment levels in urban public schools and, in particular, the factors associated with white losses. These white losses, sometimes dubbed "white flight," arise not only when white families

* I am grateful to Helen Ladd, Jens Ludwig, Theresa Newman, Sean Reardon, Jacob Vigdor, and several referees for helpful comments and to Thomas Anderson, Cathleen McHugh, and Randy Walsh for research assistance.

move from one district to another or enroll in private schools, but also when they simply avoid moving into districts with high interracial contact. Utilizing data covering all public schools and districts in a sample of metropolitan areas, the study assesses trends over the period 1987 to 1996 for all major districts in these metropolitan areas, not just central city districts. It examines changes in white public school enrollments as well as changes in racial compositions, levels of interracial contact, and segregation. The data, which are taken from the Department of Education's Common Core of Data, include the enrollment by race and ethnic group of virtually every public school in 238 metropolitan areas in both 1987 and 1996.[3] In contrast, the comparable data used in most previous research were collected only for selected districts, making it necessary to restrict attention to large urban, mostly central city districts.[4] The data used in the current study cover all districts, thus making it feasible to obtain a complete picture of each metropolitan area's public schools and to examine patterns over time in those metropolitan areas. Thus it is possible to see if the kinds of patterns observed in the 1960s and 1970s are still evident, with the maturation of school desegregation as a policy. It is particularly interesting to trace the effects of recent demographic trends, including significant ethnic shifts arising from immigration, as well as public policies aimed at fostering integration. It will be important as well to reflect insofar as possible the tremendous heterogeneity among metropolitan areas – by size, region, age, number of central cities, and number of school districts. One dimension of heterogeneity is the physical distance separating districts. Fortunately, the data set's complete coverage of districts allows one to take into account the geographical proximity of districts to which whites might consider moving in order to escape high concentrations of nonwhites.

The study addresses two sets of questions. First, it will be useful to describe recent trends in enrollment and racial composition. Is the movement of whites out of central cities slowing or accelerating? Are interracial contact and segregation increasing or decreasing? And, is there evidence that the South, whose previous patterns were deeply influenced by the existence of legal segregation in schools, is evincing patterns increasingly similar to the North? Second, it is important to raise again the perennial question of whether and how desegregation contributes to white enrollment losses. Is there evidence of tipping points in these losses, as previous research has suggested?[5] Do white reactions to interracial contact differ by nonwhite group?

Section I provides background for the analysis, including a brief review of related statistical studies. Section II describes the data used and the variables defined in the current study. Section III presents and discusses regression analysis for a sample of districts, and section IV examines the implications for changes at the metropolitan level. There is a brief concluding section.

I. Background

Although the landmark *Brown v. Board of Education* was handed down in 1954, it was not until the late 1960s that many Southern school districts had undertaken substantial efforts to desegregate their schools. But when desegregation did take place, it typically produced dramatic changes in interracial contact. Between 1968 and 1972 the percentage of black students going to schools with 90 to 100 percent minority enrollments fell from 78 to 25 percent in the South, by far the biggest change in any region (Orfield 1983, p. 4). Concomitantly, the exposure of whites to blacks increased, largely but not exclusively in the South.[6] In urban areas this desegregation often took the form of cross-district busing, a policy that was endorsed by the Supreme Court in its 1971 decision *Swann v. Charlotte-Mecklenberg Board of Education.*

Research on Desegregation and "White Flight"

One major concern that developed in the wake of this and other federal court decisions was whether these actions would cause white families to leave desegregating districts, thereby undercutting the potential for racial integration. To examine the question of whether school desegregation itself caused "white flight,"[7] James Coleman and two colleagues (Coleman et al.1975) examined enrollments in a sample of districts data over time, concluding that larger white enrollment declines were associated with declines in measured segregation and with higher proportions of black students. Although this conclusion met with initial opposition, the bulk of subsequent empirical research has supported the main thrust of that study.

With a few exceptions, the empirical studies of the effect of desegregation on white enrollment have utilized school-level data on enrollment by race, collected since 1967 by the Office for Civil Rights (OCR), data which allow the calculation of indices of interracial contact and segregation as well as changes in total enrollment. The unit of observation has generally been the school district, with most studies focusing on urban districts. In general, the studies have attempted to distinguish changes in white enrollment that are attributable to desegregation policies from those that would have occurred in their absence. That is, since whites have been declining as a percentage of all public school students in the country, and many central cities have witnessed the decline in white population for years, it would be incorrect to attribute all of those declines to desegregation policies. Two studies that sought to assess the Coleman et al. results were Clotfelter (1979) and Farley, Richards, and Wurdock (1980), the former reanalyzing the original data set and the latter using a sample of 104 urban school districts. Both studies supported the basic Coleman et al. findings.

Subsequent studies likewise suggested that white enrollments are sensitive to the presence of nonwhites in the public schools. Wilson (1985) contended that racial contact, irrespective of the form of the policy, is the central cause of such losses. But a number of subsequent studies concluded that the form of the policy was important, with white losses being greater under mandatory desegregation plans than under voluntary plans. Welch and Light (1987), Rossell (1990, 1994), and Rossell and Armor (1996) all compared the effects of different desegregation techniques, and concluded that mandatory plans such as pairing or clustering lead to bigger white losses. Some recent evidence offered by Armor (1995, p.179) further supports the hypothesis that whites are sensitive to changes in racial composition in schools attended by their children. Focusing on formerly minority schools to which whites were assigned as part of mandatory desegregation plans, Armor shows abnormally high proportions of "no-shows" among the whites. Similar sensitivity to racial composition is apparent in Lankford and Wyckoff's (1997) study using the school choices of individual families in metropolitan areas in New York State. All of this empirical work supports the working assumption stated by James (1989, p. 966): "white parents make decisions based on the actual or potential exposure of their children to blacks, not how equally students are assigned to schools by race."

Recent Patterns and Trends

Before analyzing recent data on school racial patterns and white enrollment changes, the broader patterns and trends in metropolitan areas should be considered. A basic fact is that public schools at the metropolitan level tend to be quite segregated, in that the observed patterns of enrollment by school depart markedly from racial balance. This divergence is greatest in the largest metropolitan areas. By region, metropolitan-level segregation tends to be most severe in the Northeast and Midwest, least in the West and South. The bulk of this observed segregation can be attributed to disparities in racial composition among the various school districts in metropolitan areas, as opposed to segregation within districts.[8] Thus a considerable portion of existing school segregation in metropolitan areas is associated with segregated housing patterns. Combined with the Supreme Court's decision in the 1974 *Milliken v. Bradley* case, this residential segregation virtually guarantees public school segregation in urban America for the foreseeable future. Although Cutler, Glaeser and Vigdor (1999) find that neighborhood segregation declined after 1970 and Farley and Frey (1994) report some lessening of residential segregation in metropolitan areas during the 1980s (especially in younger, smaller areas), those residential patterns remain highly segregated. Moreover, Massey and Hujnal (1995) argue that segregation among jurisdictions has been increasing. Movements inside metropolitan areas continue to be dominated by suburbanization by the middle class, both white and nonwhite, leaving concentrations of poor people in parts of central cities.

Another set of trends with important implications are demographic. The racial and ethnic composition of the school-age population is changing. Owing to immigration and differences in birth rates, the black and Hispanic school-age population is growing faster than that of the white population. As shown in Table 1, between 1986 and 1996, while the number of whites in public elementary and secondary schools was increasing by 3 percent, the number of black students rose by 14 percent, and the number of Hispanic students rose by 45 percent. According to Frey (1995), the recent, ethnically diverse immigration that underlies some of these changes has profoundly influenced patterns of internal migration, so that immigrants have come to supplant natives in some metropolitan areas. Combining these demographic trends with ongoing suburbanization, it should come as no surprise that public schools are becoming, on average, increasingly nonwhite.[9] Beyond that, however, the implications for school segregation and white enrollments are by no means obvious.

Another set of changes, related to education policy rather than demography, arise from consolidations of school districts. Although the findings in the present study suggest that any movement in this regard is relatively minor, the temporal comparisons examined in this paper require consistency in the definition of districts over time. Thus it will be necessary to pay attention to consolidations and other changes in district boundaries.

A final trend with obvious relevance has to do with changes in attitude and race relations. Although changes in this area are nothing if not complex, it appears that, over the last two decades, interracial contact has slowly increased and white racial prejudice has declined steadily.[10]

II. **Data and Methodology**

The principal source of data used in the present paper is the National Center for Education Statistics' Common Core of Data, which includes information on the racial composition of individual schools.[11] The research strategy for the current study was to collect information for similarly-defined metropolitan areas at two points in time in order to assess changes over that period. Data were not available for all metropolitan areas, however. The data are supplied voluntarily by states, and, while the number of participating states has increased steadily, a significant number did not participate during the 1980s. Weighing the advantages of a longer period against the disadvantages of a smaller sample size, the decision was made to use 1987 as the beginning year. The Common Core for the fall of that year lacked data for 17 states, compared to only two states that were missing in 1996.[12]

Calculations were made for metropolitan areas in both 1987 and 1996, using the component counties (or, in New England, towns and cities) for each defined by the Census in 1990. Thus, while the definitions of metropolitan areas are periodically updated, the present paper utilizes the definitions as of 1990 in order to achieve comparability over time. Given these definitions and the states for which data were available, sufficient data were available for 238 metropolitan areas to make comparable calculations for both 1987 and 1996 (see Table A1). In 1996 these 238 areas contained almost 4,000 districts. As in the case of the metropolitan areas, it was desirable to have consistent definitions of the school districts over the period. However, this aim was frustrated by changes in district boundaries over time, most commonly consolidations of two or more 1987 districts into one 1996 district. Through careful accounting, comparable districts were formed, typically by combining the components of the consolidated district into a "virtual" district in 1987. These virtual districts constituted only about 2 percent of the districts in the sample.[13]

Measures and Variables

The basic measure of white behavior is changes in white public school enrollment. This measure is necessarily a net measure, reflecting the difference between departures and new enrollments. As such, the measure cannot measure the absolute number of departures, nor can it identify whether departures take the form of moving to another district, enrolling in a private school, or simply graduation. Nor can it reflect the choice *not* to move into a district in the first place, a decision having much the same impact as a departure. Where W_0 and W_t are white enrollments in years 0 and t, the change in white enrollment is expressed as the exponential growth rate g in the equation

$$W_t = W_0 e^{gt}.$$

Expressed as a percentage, the growth rate between 1987 and 1996 is

$$100 g = 100 \ln (W_{96}/W_{87})/9.$$

Measures of composition and segregation are based entirely on racial and ethnic categories used in the survey. While it would be much preferable to examine economic as well as racial differences in measuring contact and segregation, the only measure of family income –the receipt of free or reduced price lunches -- is available in 1987 for only a small fraction of the districts in the sample:[14] The basic measure of interracial contact is the exposure rate of whites to nonwhites, which is the percentage nonwhite in the average white student's school. It is defined as:

$$E = (1/W) \sum_i W_i \, [N_i /(W_i + N_i)] \; , \qquad (1)$$

where W_i and N_i are the number of whites and nonwhites, respectively, in school i and W and N are their totals for the district. If schools were racially balanced, each white child would attend a school whose racial composition was PCN = N/(W+N), the overall proportion of students who are nonwhite. The gap between this theoretical maximum and the actual rate of racial contact, expressed as a proportion of the area's racial composition, represents one measure of the extent of segregation.[15] This gap-based index of segregation,

$$S = (PCN - E)/PCN, \qquad (2)$$

ranges from zero, signifying perfect racial balance among schools, to one, signifying total segregation. S is a measure of the evenness with which whites and nonwhites are distributed among schools. While one would expect E to rise as a district's percentage nonwhite increases, no similar presumption applies to S. Since the measures of exposure and segregation are based on school-level enrollment data, they do not measure racial contact in classrooms or in school groups. Nor do these measures differentiate between mandatory desegregation orders and voluntary desegregation plans.[16]

To account for differences in overall growth among metropolitan areas, the population growth rate, expressed as a percentage, is included as an explanatory variable:

$$PG = 100 \ln (P_{90}/P_{80})/10. \qquad (3)$$

Finally, to account for the differing legal history of school segregation and other, otherwise unmeasured regional differences, metropolitan areas were assigned to one of five regions: South, Border, Northeast, Midwest, and West.[17]

Patterns and Trends in the Data

Before discussing the last set of variables, it is useful to examine the entire sample of 238 metropolitan areas for patterns and trends. Table 1 compares total public school enrollment for the nation with the enrollment in the 238 metropolitan areas analyzed in the current study. Not only does it give a sense of overall demographic changes over time, the table also allows an assessment of how representative the data used in the present analysis are. As indicated by the total enrollment figures, the present sample -- although it omits all schools outside of metropolitan areas as well as metropolitan areas for which complete data were not available -- still covers more than half of all public school students. As expected, the racial composition of these metropolitan areas differs from that of the nation at large, featuring a higher percentage of nonwhites than the U.S. as a whole. It is clear also that the racial composition of the nation and metropolitan areas has been changing over time, with nonwhites assuming a continually increasing share. The reason behind this changing composition is illustrated in the table's last column, which lists average annual growth rates for each racial and ethnic group. Enrollment of whites grew at 0.5 percent a year, slower than the rate for blacks (2.0 percent) , and considerably slower than the 5.4 percent rate for Hispanics and the 4.4 percent for other nonwhite students.

To illustrate the sort of data examined, Table 2 presents several measures for 16 metropolitan areas of various sizes and from different regions. The table makes plain the great dispersion in size of metropolitan areas: public school enrollment in these 16 areas in 1987 ranged from 1.3 million in the 83 districts in the Los Angeles-Long Beach PMSA to 32,000 in the two districts covered by the Tallahassee MSA. It also reveals marked differences in the extent of jurisdictional fragmentation. In keeping with the findings of Clotfelter (1999), larger metropolitan areas, and those in the Northeast and Midwest, tended to have more districts than smaller areas and those in the South and West. The areas also differed markedly in racial and ethnic composition. The percentage of students who were nonwhite (which includes Hispanic whites) ranged from 3 percent in Johnstown to 71 percent in Los Angeles-Long Beach, with other nonwhites outnumbering blacks in the latter. Blacks were relatively most numerous in the Southern areas. Columns F and G of the table give the average annual growth rate in white and nonwhite enrollment for metropolitan areas. Reflecting the national trends shown in Table 1, nonwhite enrollments were increasing in all these metropolitan areas, while whites increased in only about two thirds of them.

Racial segregation at the metropolitan level differed quite a bit among the 16 areas shown, but the calculated indices for individual metropolitan areas did not change greatly over the period. Clotfelter (1999) shows that segregation in the public schools is most pronounced in the largest metropolitan areas, and the calculations for the areas shown in this table bear out that generalization; Detroit, in fact, was found to have the most segregated schools among all metropolitan areas studied in 1994. However, some of the areas, in particular the seven with indices less than 0.20, exhibited quite low levels of segregation, suggesting near racial balance throughout the public schools in each metropolitan area.

Because most of the interest in white withdrawals from public schools has focused on individual school districts, especially central city districts, it is especially pertinent to examine data for some illustrative districts. Table 3 presents information for the two largest districts in each of the 16 metropolitan areas shown in Table 2. For a majority of the metropolitan areas, the largest district also shares the name of the area's primary central city. In 1987 these districts showed a tremendous range in size -- from 582,871 in Los Angeles to 3,104 in Somerset, PA. As a percentage of their respective metropolitan areas, they ranged from 74.1 percent in Hillsborough County, Florida to 2.9 percent in Lynn, Massachusetts. In most cases, the largest district in each metropolitan area had both a higher nonwhite percentage and a slower growth rate of white students than the metropolitan area as a whole. (Exceptions were in Raleigh-Durham and Tallahassee.) Their growth in nonwhite enrollments was less predictable, however, with 19 of the

32 districts having faster nonwhite growth than their metropolitan areas. Revealing their generally low levels of segregation, exposure rates were quite close to their overall nonwhite proportions. The last column relates to the opportunities open to white families to reduce their children's exposure to nonwhites in the public schools by locating in other districts in the metropolitan area. This measure of access is discussed in the following section.

To get a more representative picture of racial composition and white enrollment growth in districts, Table 4 presents weighted mean values by the size and region of each district's metropolitan area. The table shows clearly that the nonwhite percentage tended to rise with metropolitan area size: while the smallest metropolitan areas had enrollments that averaged 25 percent nonwhite, those in the largest metropolitan areas averaged 54 percent. By region, the components of the nonwhite percentage differed markedly, with blacks being most numerous in Midwest districts and Hispanics and other nonwhites most numerous in the West. Overall, white enrollments were declining over the nine-year period. They declined most rapidly in districts contained in the largest metropolitan areas, and they grew slightly in districts within the smallest metropolitan areas.

The Spatial Context of Enrollment Choices

An important aspect of enrollment shifts in metropolitan areas lies in their spacial context. White residents which, for whatever reason, desire to enroll their children in public schools with a smaller proportion of nonwhites than their current school usually can bring this about by moving to another district. Whites who are moving into a metropolitan area can simply avoid districts with high nonwhite enrollments. But locating in predominantly white districts may entail longer commutes to work. Thus the desirability of moving from or avoiding a given urban district will likely depend on the existence of alternative public school districts with lower nonwhite percentages, the extent of the difference in racial compositions, and the distance from that given district to the alternative districts.

A few examples will readily demonstrate the kinds of choices and trade-offs available in most metropolitan areas, and how those alternatives differ from district to district. A white family whose children attended the Detroit City Schools in 1987, where the average white attended a school that was 67 percent nonwhite, could have moved 11 miles away to the Warren Consolidated School District, where the exposure rate of whites to nonwhites was only 4 percent. A similar white family in Anaheim, California, whose children faced a 73 percent exposure rate in Santa Ana, could move to one of several school districts within 10 miles that offered lower exposure rates: Orange USD (28 percent) was less than three miles away, while Irvine USD (23 percent) was five miles away. By contrast, white families in Raleigh, North Carolina, where the exposure rate was 28 percent in 1987, would have had to move almost 25 miles away, to Chapel Hill, to attend schools with a lower exposure rate.

As these three examples amply illustrate, districts can differ greatly in how easy it is for white families to lower their exposure to nonwhites by avoiding or moving from some districts. As illustrated by the largest two districts in each of the 16 illustrative metropolitan areas shown above, comparatively white alternatives are not uncommon, but in some metropolitan areas they simply do not exist. As an illustration of how common such alternatives were in 1987, a tabulation showed that over a third of white students in the 975 largest districts in the current sample could have lowered their exposure rate by at least 0.10 by moving to a district within 10 miles.[18] If one wishes to model white enrollment shifts, it is important to take such alternatives into account. While a few studies of school segregation and white flight have included variables that are designed to reflect the opportunities for avoidance on a very aggregated level within metro areas,[19] none to my knowledge has incorporated data on distance among districts in a metropolitan area.

In the present paper I use a measure of accessibility to characterize the options facing white families in metropolitan areas. It is designed to account for three spatially-related factors that would impinge on any white family's decision to move to another district, to avoid moving into a district in the first place, or to enroll in a private school: a) the existence and size of other districts in the same metropolitan area; b) the distance to those other districts; and c) the degree to which interracial exposure could be reduced by locating in one of them.[20] Among the many measures that could be devised to reflect these aspects, I use a relatively simple one. Taking all the districts that are within 10 miles of a given "home" district as feasible alternatives, this measure focuses on the districts in this group which feature exposure rates to nonwhites at least 10 percentage points (0.10) lower than the home district. In order to account for the relative size of these possible destination districts, this measure of accessibility is based on the ratio of the enrollment of such districts to that of the origin district. Where district j is the origin, or "home," district, from whose perspective the calculations are made, districts k are possible alternative districts, D_{jk} is the distance between districts j and k, E_j is the average exposure rate of whites to nonwhites in district j, T_j is the enrollment in district j, and E_k and T_k are defined similarly, the measure is the ratio of the enrollments of these substantially whiter districts to that of the home district[21]:

$$Access = \square_j \ (T_j/T_i) \text{ for all j, s.t. } E_i\text{-}E_j \ \square\ 0.10 \text{ and } D_{ij} \ \square\ 10 \text{ miles.} \quad (4)$$

In order to approximate distances between pairs of districts, I measure the distance between the centroids of the zip codes in which the district offices are located.[22]

To give a sense of the values for *Access*, Table 3 presents calculations of this index for the two largest districts in each of the 16 metropolitan areas listed in Table 2. This index suggests considerable divergence in accessibility to whiter enclaves among this group of 32 districts. Of the districts those listed in Table 3, those where whites are deemed to have more opportunities for avoidance are Lynn, MA, Aldine, TX, Boston, and Providence, all of which feature high exposure rates and proximity to districts with much lower ones. At the other end of the opportunity spectrum are large districts with relatively low exposure rates: Leon County, FL, Wake County, NC, and Warwick, RI.

III. Analysis of White Enrollment Changes by District

A perusal of Table 3 suggests that the districts having the fastest white enrollment declines tended to be those with high proportions of nonwhites and more opportunities for avoidance of nonwhites. To examine whether white enrollment trends more generally are influenced both by the "push" of interracial contact and the "pull" of nearby whiter school districts, I estimated equations explaining districts' growth rate in white enrollment between 1987 and 1996. Previous analysis of "white flight" from urban school districts focused almost entirely on large, central city districts, most of which were in large metropolitan areas. Indeed, Coleman (1975, p. 11) stated: "The flight from integration appears to be principally a large-city phenomenon." Because of the continuing significance of their enrollment patterns, these big urban districts should obviously remain a major focus of research. However, it is important to explore whether other types of urban districts in metropolitan areas exhibit similar patterns. For example, small metropolitan areas, owing to the comparative ease of traversing them, may evince different residential and enrollment patterns than large metropolitan areas. Another possibility worth examining is that enrollment patterns for districts which are small relative to their metropolitan areas might be easier to avoid or be otherwise different from dominant districts. Given the large number of metropolitan areas and districts encompassed by the current sample, it is possible to analyze separately districts according to metropolitan area size. It is also possible to distinguish between districts that account for a significant share of their metropolitan area's total enrollment and those that are small in relation to the whole.

Accordingly, the 3,933 districts in the sample were divided into four samples. The first three samples were restricted to districts of at least 5,000 students. Not only are these the most important districts to study, measured enrollment growth for them is less subject to error or undetected changes in district definitions. Sample A includes those sorts of districts which have traditionally received the bulk of attention in studies of white enrollment losses; these are major districts (those with at least 10 percent of the total enrollment of their respective metropolitan area) in metropolitan areas with public school enrollments of 50,000 or more. Sample B includes major districts in metropolitan areas with enrollments smaller than 50,000. Sample C includes districts with less than 10 percent of their metropolitan enrollment; given the 5,000 minimum size, these districts were thus all in metropolitan areas of 50,000 or more. The remaining districts, those smaller than 5,000, comprise Sample D; this sample contains over three quarters of all the districts studied.

Previous econometric studies of white enrollment losses have sought to explain white losses, usually measured by percentage change, as a function of variables describing racial composition, segregation, and other factors thought to be important in the decisions of white families. One early and influential study, by Coleman et al. (1975), noted above, used panel data on a set of large urban districts to estimate the equation:

$$\%\square W = a + b_1 \square S_b + b_2 P_b + b_3 \ln T + ëZ + u, \qquad (5)$$

where $\%\square W$ is the percentage change in white enrollment, $\square S_b$ is the change in the segregation index (using blacks in place of nonwhites), P_b is the proportion of blacks in the district, T is district enrollment, Z is a vector of other variables, a, the b_i's, and the vector ë are coefficients, and u is an error term. As noted above, Coleman et al. found that greater white losses were associated with higher black proportions and decreases in segregation, leading to their conclusion that school desegregation was causing white flight, and was therefore contributing to the resegregation of schools.[23] Noting that the percentage form of the segregation measure $\square S_b$ leaves it relatively uncorrelated to changes in overall racial composition, Coleman et al. (1975, p. 57) argue that this variable is "approximately independent" of contemporaneous white losses and thus they used ordinary least squares to estimate equation (5). This assumption is relaxed in some of the regressions presented below.

The present study employs a similar model, but with a wider variety of school districts and with a single cross-section of growth rates in white enrollments over a single nine-year period in place of the pooled annual changes analyzed by Coleman et al. Change in white enrollment is measured by the exponential annual growth rate. In place of the district percentage black, I used the exposure rate of whites to nonwhites (in the beginning year of 1987), because exposure, not overall district racial composition, affects the experiences of whites, and to reflect the large and growing significance of Latinos and Asian-Americans in urban school systems. Accessibility to whiter alternative districts is measured by *Access*, as described above. The growth rate of metropolitan area population from 1980 to 1990 is included to account for overall metropolitan growth. It seems reasonable to treat this growth as an exogenous variable. Finally, a set of dummy variables is included to reflect regional differences in the growth of white enrollments.

Table 5 presents for each of the samples of districts the mean values for the basic variables used in estimation. Among the four samples, the growth rate of white enrollment, the exposure rate, and the accessibility measure all differ noticeably. The two samples of districts in the largest metropolitan areas, A and C, show declines in white enrollments on average, whereas white enrollments in the average district in sample B remained steady over the period and those in the smallest districts grew. The sample A districts had much higher rates of exposure of whites to nonwhites than those in B and C, fitting the common image of large central city districts, while the smallest districts displayed the lowest exposure rates. Accessibility to districts with lower exposure rates also differed, with the smaller districts in C and D having indices indicating easiest access to white enclaves. Measured racial segregation in 1987 was greatest in the major districts in the largest metropolitan areas, but in none of the samples was segregation as pronounced as it tends to be in metropolitan areas.[24] And it changed very little over this period, signifying the extent to which desegregation policy in most districts had more or less done its work by 1987. Similar patterns and trends were evident for segregation by income class.[25] Finally, it is also worth noting that sample D has relatively fewer districts in the South, owing to the large average size of districts in that region.

Table 6 presents the basic model explaining growth in white enrollments estimated for each of the four samples of school districts. The first four equations use ordinary least squares estimation, and the second four use instrumental variables. The similarity of the estimates across the four samples is quite striking, undercutting any notion that big urban districts are somehow unique with regard to the mechanisms driving white enrollment losses. Three variables are consistently important in explaining white growth rates in this basic model, regardless of the sample or estimation technique employed: the exposure rate in 1987 (the "push"), the accessibility to whiter districts (the "pull"), and the overall metropolitan growth rate.

The exposure of whites to nonwhites in 1987 has large and statistically significant estimated coefficients in all four samples. Equation (1), for example, implies that in the most important districts in the large metropolitan areas an increase in exposure of 0.10 – say from 0.15 to 0.25 – in 1987 would have been associated with an acceleration of white losses, in the form of a decrease in the growth rate of white enrollment of -0.7 percent a year. The estimated effect is somewhat smaller in sample B, but it is considerably larger in samples C and D, implying a responsiveness half again as big in the "minor" and smallest districts. The strong effect of exposure in all four samples is very much in line with Coleman et al.'s results for the district's proportion of blacks and with James' (1989) stated assumption that whites respond to interracial contact, not segregation per se.[26]

Before turning to the other explanatory variables, it is worth considering the possibility that the coefficients for interracial exposure are overstated in these regressions. Bias of this sort could occur if there existed a persistent tendency for whites to leave some districts at faster rates than other districts, a tendency unrelated to the racial composition of the public schools and one affecting whites but not nonwhites. Over time, such a tendency would tend to increase the percentage of nonwhites in these districts, other things equal, and could lead to an increase in the exposure rate of whites to nonwhites, resulting in a statistical correlation between rates of white loss and high exposure rates. Omission of a measure of this persistent tendency from the regression would therefore bias the estimated coefficient of the exposure rate. While this scenario is a possibility, it appears unlikely. There have certainly been persistent forces affecting the movement of whites and nonwhites from central cities, such as income trends and housing discrimination, but it is difficult to discern systematic variation in them from one urban area to another.[27] Even if such an omitted effect were at work, the strong and consistent association evident in these estimates would remain, showing that the rate of white loss is greatest from districts with the highest exposure rates to nonwhites.

In addition to the exposure rate, a variable with consistently significant coefficients is the accessibility measure *Access*. White losses were greater where there were more opportunities in the metropolitan area for whites to find districts with lower rates of exposure. This finding is, in effect, the complement to the first, the avoidance of high exposure rates. The third consistent finding is that white enrollment trends were – not surprisingly – influenced by overall metropolitan growth. Where the metropolitan population was growing, white enrollments in large districts tended to grow rather than shrink, but where the metropolis was stagnant there was less impetus to maintain white enrollments. This correspondence is much higher in the smaller metropolitan areas of sample B and the small districts in sample D.

For the most part, the equations reveal little regional variation in white enrollment growth apart from that which is explained by the other included regressors. Only in samples C and D is there a statistically significant regional effect: in those relatively small districts, whites were less likely to leave or avoid districts in the South.

The major policy variable in the equations is the change in the segregation index. Holding constant interracial exposure in 1987, an increase in segregation would be expected to hold whites and thus increase the white enrollment growth rate (or decrease the rate of loss). This is what Coleman et al. (1975) found in their study of larger urban districts. And it is also what is implied in equation (1) in Table 6, the OLS equation covering the sample most similar to the ones they analyzed. The estimated coefficient in that equation implies that an increase in the segregation index S of 0.10 would have decreased the rate of white enrollment decline by 0.83, say from its mean of -1.55 to -0.72 percent a year. However, the corresponding coefficients in the other equations are not statistically significant.

Changes in measured segregation may not be exogenous. Since the segregation index is largely dependent on a district's desegregation policy, and that policy could be influenced by white enrollment trends, enrollment trends could affect measured segregation. For this reason, the basic model was reestimated using instrumental variables. Among the instruments employed to explain the change in measured segregation were dichotomous variables indicating the federal circuit in which the school district was located and whether the school district was named in a federal district court decisions between 1987 and 1995.[28] The estimated effect of the change in segregation in the instrumental variables equations loses its statistical significance in equation (5), and it is not significant in the remainder of the equations. The first stage equations in all these equations are fairly poor predictors of the change in segregation, with the result that estimated coefficients are generally small relative to their standard errors, though with little change in the other coefficients of interest.

Central to these estimates is the reaction of white parents to the presence of nonwhites in the schools their children attend. It is especially germane to ask at least two questions related to that reaction. First, are whites more sensitive to one group of nonwhites than to others? To examine this question the first four equations in Table 7 split up the exposure rate of whites to nonwhites into three components, corresponding to blacks, Hispanics, and other nonwhites. For all but sample B, an F-test rejects at the 99 percent level the hypothesis that all the coefficients are the same. In each of those cases, the estimates suggest that whites respond most sharply to exposure to blacks[29]

The other exposure-related question addressed in Table 7 is whether the reaction of whites to nonwhite exposure in the schools is nonlinear, specifically whether there is a "tipping point," or a threshold exposure rate beyond which white departures and avoidance accelerate. To allow for such nonlinearities, both cubic and spline functions were estimated, with much the same result. Plots of the former are shown in the table and illustrated in Figure 1, which gives the predicted rate of growth of whites, calculated at mean values, as a function of exposure to nonwhites in 1987. They are remarkably similar, implying growth in white enrollments where exposure rates are below about 0.25 and losses beyond that point. Over most of the range of exposure rates the rate of loss is approximately linear. There is no evidence of a threshold beyond which losses accelerate. In fact, losses are reversed somewhat at very high exposure rates in samples A and C.

The conclusion that arises from these regressions is that the phenomenon of "white flight," the loss of whites from school districts featuring significant interracial exposure, first identified and studied in the 1970s, was still at work in the 1990s. To be sure, white enrollment losses are made more likely by a slowing growth rate among the white population nationally and in metropolitan areas that are not growing, but they continue to be stimulated by exposure to nonwhites in the public schools, especially where those rates become large. Such white losses are moderated by configurations of school districts that minimize the opportunities for avoidance, such as the large county-wide districts common in parts of the South and West.[30] It is noteworthy that these results apply to both large and small districts and to those in both larger and smaller metropolitan areas. The estimates have less to say about the effect of policies that change the degree of segregation in schools. Perhaps because the period of study witnessed few significant changes in segregation, or perhaps because segregation per se is of less importance than racial contact, the coefficients on this variable were largely insignificant.[31]

IV. **Implications for Segregation in Schools**

The estimates presented above make clear that white losses from urban public schools are not evenly distributed, but rather are systematically related to interracial contact and the ease of avoiding that contact. The kind of systematic avoidance these losses imply was documented in research done in the 1970s. The present paper shows that it remained an important phenomenon in the 1990s. Since a principal concern about white enrollment losses has been that they would lead to resegregation, the impact of these white enrollment trends on measured segregation should be considered. Overall, public schools in metropolitan areas became more segregated between 1987 and 1996. Figure 2 shows the distribution of metropolitan areas by segregation index S. It reveals a perceptible shift to the right, with a decline in the number of metro areas in the lowest two categories and increases in most of the higher categories.

Table 8 presents a more detailed summary of changes in metropolitan-level school segregation. The entries give the weighted average of the segregation index S for the 238 metropolitan areas in the present sample, broken down by size and region. In addition, the segregation indices are decomposed into two components: the portion that is attributable to segregation between districts and that which is attributable to segregation within districts.[32] The table's top row shows that, for the entire sample of 238 metropolitan areas, school segregation increased over the nine-year period; the average value of S increased from 0.302 to 0.317. As there was actually a decline in within-district segregation, this overall increase was entirely attributable to an increase in between-district segregation. In other words, the racial compositions of school districts tended to diverge over this period, a change that would have been aided by systematic white losses from racially mixed school districts. Table 8 makes plain the tendency noted in Clotfelter (1999) for segregation to rise with the size of the metropolitan area; this relationship is clear for both 1987 and 1996. The last set of columns shows, however, that segregation grew in all but the largest metropolitan areas over this period. When the data are classified by region, the effect of the balkanization of metropolitan areas of the Northeast and Midwest is evident: not only do those regions feature the highest rates of segregation, they also have the biggest increases in segregation – again attributable to growing disparities between districts. The South had the highest level of within-district segregation in both years. Overall, the picture that arises is one of entrenched segregation, caused mainly by racial disparities among districts rather than segregation within school districts, and steady increases in that segregation. This picture is very much in line with Coleman et al.'s (1975, p. 80) statement: "The emerging problem of school segregation in large cities is a problem of metropolitan area residential segregation, black central cities and white suburbs, brought about by a loss of whites from the central cities." Barring any change in the legal status of metropolitan desegregation, the only prospect for a reduction in school segregation is a lessening of residential segregation, a possibility raised by Farley and Frey (1994).

V. **Conclusion**

This paper uses recent data to examine an old question: what factors are associated with white losses from urban public schools? Using data covering all public schools in 238 metropolitan areas in 1987 and 1996, the present analysis suggests that much the same set of forces were at work in the 1990s as in the 1970s. The rate of white loss is affected by the "push" of exposure to nonwhites as well as the attraction of more predominantly white districts elsewhere in the same metropolitan area. Since segregation within districts by 1996 was rather mild in most districts, the key element in predicting whether whites would rapidly abandon central city districts is the size and homogeneity of all the districts in a metropolitan area. In particular, where the dominant districts are large, the prospects for avoiding large white losses are good. Furthermore, these forces appear to work similarly both inside and outside the South, without regard to the size of the district or the metropolitan area. To be sure, the world of urban public schools did change over the two decades. The proportion of nonwhites grew, in significant part due to immigration.

In addition, the relative affluence of those at the upper end of the income distribution rose at the same time that Catholic parochial schools were in decline, probably increasing the socioeconomic gap between public and private schools.

Not surprisingly, the current paper leaves some important questions unanswered. For example, the models used do not distinguish between residential location and private school enrollment as alternative avenues for white avoidance of racial exposure. The relative cost of these options surely affects their use; this relative cost is only crudely proxied by the measures used here to reflect accessibility to white enclaves. Nor does the paper examine the effects of contact across socioeconomic groups, as opposed to the racial and ethnic groupings used here and elsewhere. In addition, the data used in the paper contain no information on racial contact within schools, which is affected by the extent of academic tracking. Nor do the measures used here distinguish between mandatory desegregation plans and the various alternative policies that have been used to desegregate schools. Factors such as these are likely to be important considerations for parents – both white and nonwhite – deciding where to send their children to school. Given the implications of these decisions for the racial composition and segregation of the public schools, research on this topic remains as important today as it was two decades ago.

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Table 1

Public School Racial and Ethnic Composition and Growth by Group:

238 Metropolitan Areas and All United States

238 Metropolitan Areas	1987	1996	Average growth rate
	Racial composition (%)		
White	67.1	60.3	0.5
Black	14.5	14.8	2.0
Hispanic	14.0	19.4	5.4
Other nonwhite	4.3	5.5	4.4
Total	100.0	100.0	1.7
Total enrollment	20,313,388	23,742,341	

United States	1986	1996	
	Racial composition (%)		
White	70.4	64.0	0.6
Black	16.1	17.0	2.1
Hispanic	9.9	14.1	5.1
Other nonwhite	3.7	4.9	4.4
Total	100.0	100.0	1.6
Total enrollment	40,008,213	45,592,213	

Source: Common Core of Data, author's calculations; U.S. Department of Education, Digest of Education Statistics 1996, Table 39, p. 52 and Table 44, p. 60; U.S. Department of Education, National Center for Education Statistics, Statistics in Brief, October 1998, Tables 1 and 6.
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Table 2

Illustrative Data for 16 Metropolitan Areas

	A	B	C	D	E	F	G	H	I
Metropolitan area		Metro	1987 percentage:			1987-1996 growth rate in enrollment(a)		Segregation (S)	
	Number of districts	enrollment 1987	Black	Other non-white	Total non-white	White	Non-white	1987	1996
Los Angeles--Long Beach, CA PMSA	83	1,301,780	0.14	0.57	0.71	-2.1	2.8	0.35	0.34
Detroit, MI PMSA	109	712,284	0.28	0.03	0.31	0.1	1.0	0.73	0.72
Houston, TX PMSA	41	591,404	0.24	0.28	0.52	0.2	4.1	0.39	0.41
Boston, MA PMSA	113	353,727	0.11	0.09	0.21	0.2	3.7	0.46	0.47
Tampa-St. Petersburg	4	244,906	0.17	0.07	0.24	1.4	5.5	0.13	0.19
Milwaukee, WI PMSA	51	210,975	0.24	0.07	0.31	0.0	3.7	0.45	0.55
Portland, OR PMSA	63	187,371	0.05	0.08	0.13	1.2	5.7	0.16	0.13
Cleveland, OH PMSA	54	249,729	0.29	0.03	0.32	0.8	1.5	0.59	0.64
Fresno, CA MSA	46	126,694	0.06	0.51	0.57	-0.3	5.1	0.26	0.27
Raleigh--Durham, NC MSA	7	102,132	0.34	0.02	0.36	2.7	3.9	0.17	0.14
Providence, RI PMSA	23	86,231	0.07	0.09	0.16	-0.4	5.4	0.44	0.55
Davenport--Rock Island--Moline, IL	23	62,343	0.09	0.05	0.14	-0.8	2.6	0.17	0.17
Rockford, IL MSA	13	45,165	0.13	0.06	0.19	0.1	4.4	0.19	0.19
Eugene--Springfield, OR MSA	16	44,121	0.01	0.05	0.06	0.3	5.7	0.02	0.02
Johnstown, PA MSA	23	36,807	0.02	0.00	0.03	-0.9	1.3	0.14	0.11
Tallahassee, FL MSA	2	32,366	0.48	0.02	0.50	1.4	2.4	0.32	0.36

Source: U.S. Department of Education, Common Core of Data, 1987 and 1996; author's calculations.
(a) Expressed as percentage.

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Table 3

Illustrative Measures for 32 Large Urban Districts

		A	B	C	D	E	F	G	H
Metropolitan area		Enroll-ment	1987 percentage:			1987-1996 growth rate of enrollment(a)		Exposure	
	District	1987	Total non-white	Black	Other non-white	White	Non-white	rate(b) 1987	*Access (c)*
Los Angeles-Long Beach, CA									
1	Los Angeles	582,871	0.83	0.18	0.66	-3.9	1.9	0.60	0.24
1	Long Beach	66,186	0.64	0.19	0.46	-4.1	4.8	0.57	0.76
Detroit, MI									
2	Detroit	181,121	0.91	0.89	0.03	-5.6	0.4	0.67	0.63
2	Utica Co.	23,684	0.02	0.00	0.02	0.4	5.8	0.02	0.00
Houston, TX									
3	Houston	188,370	0.84	0.42	0.42	-3.4	1.6	0.64	0.27
3	Aldine ISD	37,483	0.59	0.28	0.30	-7.1	6.3	0.55	2.07
Boston, MA									
4	Boston	59,223	0.75	0.48	0.27	-3.9	1.8	0.63	1.24
4	Lynn	10,124	0.27	0.10	0.17	-1.6	10.4	0.24	1.97
Tampa-St. Petersburg, FL									
5	Hillsborough Co.	116,908	0.32	0.21	0.11	0.3	6.0	0.29	0.00
5	Pinellas Co.	88,007	0.20	0.17	0.03	1.1	3.9	0.19	0.00
Milwaukee, WI									
6	Milwaukee	88,128	0.65	0.54	0.11	-3.7	3.4	0.57	0.79
6	Waukesh	12,457	0.08	0.00	0.08	0.4	4.1	0.08	0.00
Portland, OR									
7	Portland	51,171	0.27	0.16	0.12	-0.5	1.8	0.23	0.92
7	Beaverton	21,921	0.10	0.01	0.09	2.0	11.2	0.10	0.00
Cleveland, OH									
8	Cleveland	70,099	0.76	0.70	0.06	-1.3	0.7	0.72	0.95
8	Parma	12,141	0.03	0.01	0.02	0.6	7.8	0.03	0.00
Fresno, CA									
9	Fresno	61,365	0.60	0.11	0.49	-4.0	5.2	0.46	0.00
9	Clovis	17,961	0.27	0.02	0.25	4.2	9.0	0.25	0.00
Raleigh-Durham, NC									
10	Wake Co.	59,562	0.29	0.27	0.03	3.6	4.9	0.28	0.00
10	Durham	26,022	0.52	0.50	0.02	-1.5	3.2	0.34	0.00

Providence, RI									
11	Providence	19,237	0.57	0.25	0.32	-4.6	5.5	0.48	1.37
11	Warwick	11,834	0.02	0.01	0.01	-0.1	6.3	0.02	0.00
Davenport-Rock Island-Moline, IA									
12	Davenport	18,019	0.19	0.14	0.05	-1.6	3.0	0.17	0.76
12	Moline	7,932	0.11	0.03	0.08	-0.9	4.9	0.10	0.00
Rockford, IL									
13	Rockford	26,669	0.28	0.21	0.07	-1.8	4.0	0.24	0.49
13	Harlem	6,244	0.04	0.01	0.03	0.4	7.9	0.04	0.00
Eugene-Springfield, OR									
14	Eugene	17,250	0.07	0.02	0.05	-0.7	4.9	0.07	0.00
14	Springfield	9,894	0.06	0.01	0.06	1.0	6.2	0.06	0.00
Johnstown, PA									
15	Greater Johnstown	4,072	0.18	0.17	0.01	-1.9	-0.7	0.17	1.50
15	Somerset	3,104	0.01	0.00	0.01	-0.5	14.6	0.01	0.00
Tallahassee, FL									
16	Leon Co.	23,983	0.38	0.36	0.02	1.80	3.70	0.31	0.00
16	Gadsden	8,383	0.86	0.85	0.01	-5.90	0.40	0.73	0.00

(a) Expressed as percentage.
(b) Exposure rate of whites to nonwhites. See text.
(c) The accessibility measure *(Access)* is defined in the text. M30A

Source: Common Core of Data; author's calculations. 08/01/00

Table 4

Growth Rate in White Enrollment in Larger Urban Districts

	N	Proportions in 1987 Black	Hispanic	Other nonwhite	Total nonwhite	Growth rate of whites, 1987-96 (a)
All	875	0.18	0.17	0.05	0.40	-1.06
By size of metropolitan area enrollment						
5,000-50,000	187	0.14	0.09	0.03	0.25	0.12
50,001-150,000	240	0.19	0.15	0.03	0.37	-0.45
150,001-350,000	241	0.16	0.14	0.06	0.36	-0.82
>350,000	207	0.22	0.26	0.07	0.54	-2.54
By region						
Border	24	0.19	0.02	0.04	0.24	-0.60
Midwest	255	0.27	0.05	0.03	0.35	-1.26
Northeast	78	0.19	0.11	0.03	0.33	-1.53
South	200	0.22	0.19	0.02	0.43	-0.29
West	318	0.09	0.24	0.10	0.42	-1.58

Source: U.S. Department of Education, Common Core of Data, 1987 and 1996; author's calculations tablem36.sas 5/12/99 13:03
(a) Expressed as percentage.

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Table 5

Sample Descriptions and Weighted Means of Variable for Districts

Sample	A	B	C	D
Description (a)	Major districts in larger metro areas	Major districts in smaller metro areas	Minor districts 5,000 or more in larger metro areas	Small districts (under 5,000)
N	187	187	501	3,058
Growth rate of white enrollment, 1987-1996	-1.54	0.12	-0.90	0.56
1987 exposure rate of whites to:				
Nonwhites	0.41	0.23	0.28	0.14
Blacks	0.19	0.12	0.07	0.05
Hispanics	0.17	0.08	0.14	0.07
Other nonwhites	0.05	0.03	0.06	0.02
Accessibility to other districts with lower exposure rates *(Access)*	0.40	0.24	0.72	0.55
Change in segregation (S)	0.001	0.005	0.013	0.001
Metropolitan area growth rate, 1980-1990	1.59	1.27	1.74	0.79
Region				
South	0.38	0.41	0.20	0.12
West	0.33	0.18	0.49	0.20
Midwest	0.21	0.31	0.24	0.43
Border	0.03	0.01	0.02	0.02
Northeast (excluded category)	0.05	0.01	0.02	0.23

(a) For the purpose of defining the samples, major districts are those which enroll 10 percent or more of a metropolitan area's total public school enrollment; minor districts enroll less than 10 percent. Larger metropolitan areas are those with total public school enrollment of 50,000 or more; smaller ones have less than 50,000.

All districts in Samples A, B, and C had at least 5,000 students in 1987; those in Sample D had fewer than 5,000.

Note: means are weighted by district enrollment.

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Table 6

Estimated Equations Explaining Growth Rate in White Enrollment, 1987-1996

Sample	A	B	C	D	A	B	C	D
Equation	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Estimation	OLS	OLS	OLS	OLS	I.V.	I.V.	I.V.	I.V.
Variable								
Intercept	**1.59**	**0.91**	**1.15**	**1.25**	**1.45**	**0.93**	**1.39**	**1.23**
	0.55	*0.31*	*0.45*	*0.11*	*0.57*	*0.31*	*0.49*	*0.12*
Exposure rate of whites to nonwhites	**-6.99**	**-5.60**	**-9.67**	**-9.59**	**-7.10**	**-5.64**	**-10.67**	**-9.81**
	0.62	*0.65*	*0.79*	*0.37*	*0.64*	*0.65*	*1.01*	*0.40*
Access-ibility *(Access)*	**-0.94**	**-0.95**	**-0.58**	**-0.12**	**-0.97**	**-0.96**	**-0.57**	**-0.13**
	0.29	*0.26*	*0.13*	*0.04*	*0.30*	*0.26*	*0.14*	*0.04*
Change in segregation (S)	**8.31**	3.13	-2.55	-1.54	2.04	1.12	-21.93	-33.30
	2.04	*1.83*	*2.46*	*2.00*	*5.56*	*3.82*	*11.37*	*18.13*
Metropolitan area growth rate, 1980- 1990	**0.38**	**0.79**	**0.30**	**0.81**	**0.41**	**0.80**	**0.29**	**0.85**
	0.14	*0.08*	*0.12*	*0.06*	*0.14*	*0.09*	*0.13*	*0.07*
Region								
South	0.10	-0.28	**1.72**	**1.17**	0.18	-0.31	**2.20**	**1.13**
	0.60	*0.37*	*0.57*	*0.22*	*0.62*	*0.38*	*0.67*	*0.23*
West	-1.03	-0.52	0.60	0.31	-0.78	-0.54	0.95	0.46
	0.59	*0.37*	*0.55*	*0.22*	*0.64*	*0.38*	*0.62*	*0.24*
Midwest	-0.66	-0.29	0.05	-0.05	-0.35	-0.30	0.02	-0.01
	0.54	*0.31*	*0.49*	*0.14*	*0.61*	*0.31*	*0.52*	*0.14*
Border	-0.94	-0.31	0.30	0.09	-0.80	-0.32	0.47	-0.22
	0.77	*0.75*	*0.82*	*0.32*	*0.79*	*0.76*	*0.88*	*0.39*

Adjusted R-square	0.63	0.64	0.55	0.31	0.63	0.65	0.53	0.29

Note: Numbers below coefficients are standard errors. Bold signifies coefficients that are significantly
different from zero at the 95 percent level. Regressions are weighted by the square root of 1987
district enrollment. For definition of samples, see Table 5. For a list of instruments, see text.

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Table 7

Estimated Coefficients for Selected Variables

Equation	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	A	B	C	D	A	B	C	D
Variable								
1987 exposure rate of whites to:								
Blacks	**-8.34**	**-5.92**	**-10.39**	**-14.19**				
	1.00	*0.93*	*1.31*	*0.58*				
Hispanics	**-6.48**	**-5.35**	**-9.43**	**-8.20**				
	0.70	*0.72*	*0.85*	*0.40*				
Other nonwhites	**-6.98**	**-9.38**	**-10.19**	**-3.58**				
	2.32	*3.55*	*2.12*	*1.20*				
Exposure rate to nonwhites					-2.94	-4.95	-3.68	-3.07
					4.83	*3.77*	*3.95*	*1.75*
Exposure rate squared					-17.17	0.29	**-23.22**	**-19.25**
					11.73	*10.44*	*10.28*	*5.10*
Exposure rate cubed					16.12	-1.43	**20.55**	**13.86**
					8.28	*7.82*	*7.52*	*3.90*
Adjusted R-square	0.64	0.63	0.55	0.33	0.65	0.63	0.56	0.31

Note: Coefficients taken from regressions explaining growth rate in white enrollment.

Other explanatory variables included were: the intercept, metropolitan growth rate, accessibility *(Access)*, change in segregation, and regional dummy variables.

Numbers below coefficients are standard errors. Bold type signifies coefficients that are significantly different from zero at the 95 percent level. Regressions are weighted by the square root of 1987 district enrollment. For definition of samples, see Table 5.

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Table 8

Segregation in Metropolitan Areas, 1987 and 1996, by Size and Region

	N	-----1987 segregation --------			-----1996 segregation --------			--Change in segregation--		
		Total	Between districts	Within districts	Total	Between districts	Within districts	Total	Between districts	Within districts
All	238	0.302	0.222	0.080	0.317	0.240	0.077	0.014	0.017	-0.003
By size of metropolitan area enrollment										
50,000 or less	139	0.149	0.083	0.065	0.173	0.107	0.066	0.024	0.024	0.001
50,001-150,000	66	0.283	0.179	0.104	0.293	0.200	0.093	0.010	0.022	-0.012
150,001-350,000	25	0.311	0.243	0.068	0.335	0.261	0.074	0.024	0.019	0.006
Over 350,000	8	0.427	0.350	0.077	0.428	0.357	0.071	0.000	0.007	-0.006
By region										
Border	7	0.187	0.113	0.073	0.184	0.121	0.063	-0.003	0.007	-0.010
Midwest	76	0.403	0.340	0.062	0.426	0.367	0.059	0.023	0.026	-0.003
Northeast	36	0.349	0.303	0.046	0.375	0.341	0.034	0.026	0.038	-0.011
South	70	0.259	0.135	0.124	0.260	0.144	0.116	0.001	0.009	-0.008
West	49	0.242	0.172	0.070	0.257	0.183	0.075	0.015	0.011	0.005

Note: segregation is measured by S. See text.

Source: U.S. Department of Education, Common Core of Data, 1987 and 1996; author's calculations
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Table A1

Metropolitan Areas in the

Sample

Metropolitan area	Region	PMSA code	-----------1987------------- Enrollment	Percent nonwhite	---1987-96---- Growth rate
1 Abilene, TX MSA	S	40	21,692	29.4	1.21
2 Akron, OH PMSA	M	80	104,579	16.0	0.41
3 Altoona, PA MSA	N	280	21,198	1.7	-0.16
4 Amarillo, TX MSA	S	320	35,331	25.9	1.09
5 Anaheim--Santa Ana, CA PMSA	W	360	339,314	38.4	2.56
6 Anderson, IN MSA	M	400	23,085	11.8	-1.35
7 Anderson, SC MSA	S	405	25,145	23.7	0.34
8 Ann Arbor, MI PMSA	M	440	37,402	21.5	1.21
9 Appleton--Oshkosh--Neenah, WI MSA	M	460	46,609	4.5	2.18
10 Asheville, NC MSA	S	480	26,406	12.5	0.80
11 Aurora--Elgin, IL PMSA	M	620	76,309	22.3	2.60
12 Austin, TX MSA	S	640	124,237	40.7	3.50
13 Bakersfield, CA MSA	W	680	102,653	41.8	3.07
14 Battle Creek, MI MSA	M	780	25,177	17.5	-0.10
15 Beaumont--Port Arthur, TX MSA	S	840	71,516	36.3	0.17
16 Beaver County, PA PMSA	N	845	29,150	9.4	-0.01
17 Bellingham, WA MSA	W	860	18,939	11.0	2.64
18 Benton Harbor, MI MSA	M	870	29,969	27.8	-0.42
19 Bismarck, ND MSA	M	1010	15,161	3.0	0.81
20 Bloomington, IN MSA	M	1020	12,441	5.5	0.40
21 Bloomington--Normal, IL MSA	M	1040	18,854	8.0	1.71
22 Boston, MA PMSA	N	1120	353,727	20.6	1.01
23 Boulder--Longmont, CO PMSA	W	1125	35,721	13.8	1.99
24 Bradenton, FL MSA	S	1140	23,574	21.9	3.35
25 Brazoria, TX PMSA	S	1145	38,975	29.0	1.89
26 Bremerton, WA MSA	W	1150	32,173	13.8	2.78
27 Bridgeport--Milford, CT PMSA	N	1160	59,026	32.2	1.61
28 Bristol, CT PMSA	N	1170	11,889	5.7	0.84
29 Brockton, MA PMSA	N	1200	29,045	14.0	0.30
30 Brownsville--Harlingen, TX MSA	S	1240	68,427	91.8	1.65
31 Bryan--College Station, TX MSA	S	1260	15,335	39.5	2.30
32 Burlington, NC MSA	S	1300	16,871	26.2	1.28
33 Burlington, VT MSA	N	1305	19,794	2.0	1.40
34 Canton, OH MSA	M	1320	69,689	10.4	0.04

35 Cedar Rapids, IA MSA	M	1360	28,941	5.4	0.78
36 Champaign--Urbana--Rantoul, IL MSA	M	1400	23,253	21.4	0.13
37 Charleston, SC MSA	S	1440	81,952	44.1	0.49
38 Charlotte--Gastonia--Rock Hill, SC	S	1520	183,793	29.6	1.84
39 Chicago, IL PMSA	M	1600	854,879	52.1	1.18
40 Chico, CA MSA	W	1620	25,743	14.8	3.02
41 Cincinnati, OH--KY--IN PMSA	M	1640	218,638	19.9	0.80
42 Clarksville--Hopkinsville, TN--KY	S	1660	24,410	27.6	2.53
43 Cleveland, OH PMSA	M	1680	249,729	32.4	0.99
44 Colorado Springs, CO MSA	W	1720	69,725	21.1	2.26
45 Columbia, SC MSA	S	1760	74,384	39.6	1.31
46 Columbus, OH MSA	M	1840	204,921	15.3	1.90
47 Corpus Christi, TX MSA	S	1880	76,308	66.5	0.32
48 Dallas, TX PMSA	S	1920	425,508	39.9	2.67
49 Danbury, CT PMSA	N	1930	28,030	10.8	0.99
50 Davenport--Rock Island--Moline, IL MSA	M	1960	62,343	13.8	-0.23
51 Dayton--Springfield, OH MSA	M	2000	155,578	19.4	-0.12
52 Daytona Beach, FL MSA	S	2020	41,400	20.6	3.58
53 Decatur, IL MSA	M	2040	21,149	20.5	-1.07
54 Denver, CO PMSA	W	2080	262,862	26.6	2.08
55 Des Moines, IA MSA	M	2120	64,701	9.8	1.41
56 Detroit, MI PMSA	M	2160	712,284	30.7	0.34
57 Dubuque, IA MSA	M	2200	12,738	1.5	-0.30
58 Duluth, MN--WI MSA	M	2240	41,349	5.2	-1.11
59 Eau Claire, WI MSA	M	2290	21,611	3.3	1.12
60 El Paso, TX MSA	S	2320	130,947	80.5	1.42
61 Elkhart--Goshen, IN MSA	M	2330	26,996	9.3	1.48
62 Enid, OK MSA	B	2340	10,497	10.2	-0.27
63 Erie, PA MSA	N	2360	40,669	10.1	0.67
64 Eugene--Springfield, OR MSA	W	2400	44,121	6.2	0.73
65 Evansville, IN--KY MSA	M	2440	44,307	9.4	-0.09
66 Fall River, MA--RI PMSA	N	2480	21,972	2.8	-0.14
67 Fargo--Moorhead, ND--MN MSA	M	2520	24,184	3.7	1.54
68 Fayetteville, NC MSA	S	2560	44,039	45.3	1.60
69 Fayetteville--Springdale, AR MSA	S	2580	19,377	3.6	2.54
70 Fitchburg--Leominster, MA MSA	N	2600	12,268	14.1	2.38
71 Flint, MI MSA	M	2640	87,099	31.1	-0.57
72 Florence, SC MSA	S	2655	22,471	51.5	0.37
73 Fort Collins--Loveland, CO MSA	W	2670	29,921	10.1	2.31
74 Ft. Lauderdale--Hollywood--Pompano B., FL	S	2680	136,139	36.7	4.82
75 Fort Myers--Cape CoraL, FL MSA	S	2700	37,202	21.3	3.45
76 Fort Pierce, FL MSA	S	2710	28,733	30.6	4.11
77 Fort Smith, AR--OK MSA	S	2720	33,151	14.0	1.27
78 Fort Walton Beach, FL MSA	S	2750	24,467	16.7	2.08
79 Fort Wayne, IN MSA	M	2760	59,994	16.4	0.34

80 Fort Worth--Arlington, TX PMSA	S	2800	219,478	29.3	2.40
81 Fresno, CA MSA	W	2840	126,694	56.9	3.09
82 Gainesville, FL MSA	S	2900	27,483	34.2	1.96
83 Galveston--Texas City, TX PMSA	S	2920	54,427	34.5	1.87
84 Gary--Hammond, IN PMSA	M	2960	113,634	37.1	-0.31
85 Grand Forks, ND MSA	M	2985	11,384	8.2	0.64
86 Grand Rapids, MI MSA	M	3000	103,545	16.0	2.44
87 Greeley, CO MSA	W	3060	22,240	29.4	1.98
88 Green Bay, WI MSA	M	3080	30,552	6.2	1.98
89 Greensboro--Winston-Salem--High Point, NC	S	3120	144,252	27.1	1.15
90 Greenville--Spartanburg, SC MSA	S	3160	101,783	24.8	0.85
91 Hamilton--Middletown, OH PMSA	M	3200	47,525	7.3	1.36
92 Harrisburg--Lebanon--Carlisle, PA MSA	N	3240	91,204	13.2	0.92
93 Hartford, CT PMSA	N	3280	112,595	27.5	1.06
94 Hickory--Morganton, NC MSA	S	3290	36,791	12.2	0.92
95 Houston, TX PMSA	S	3360	591,404	52.0	2.39
96 Indianapolis, IN MSA	M	3480	204,616	19.4	0.96
97 Iowa City, IA MSA	M	3500	10,581	8.2	2.07
98 Jackson, MI MSA	M	3520	23,759	10.9	0.27
99 Jackson, TN MSA	S	3580	13,587	44.3	0.22
100 Jacksonville, FL MSA	S	3600	141,815	32.5	2.43
101 Jacksonville, NC MSA	S	3605	17,201	27.0	2.15
102 Janesville--Beloit, WI MSA	M	3620	24,556	10.0	1.21
103 Johnstown, PA MSA	N	3680	36,807	2.6	-0.82
104 Joliet, IL PMSA	M	3690	66,551	21.7	1.70
105 Kalamazoo, MI MSA	M	3720	32,194	19.1	0.60
106 Kankakee, IL MSA	M	3740	17,635	27.8	0.08
107 Kenosha, WI PMSA	M	3800	19,979	15.1	2.71
108 Killeen--Temple, TX MSA	S	3810	46,712	37.4	2.57
109 Knoxville, TN MSA	S	3840	95,561	9.0	1.12
110 Kokomo, IN MSA	M	3850	18,698	7.6	-1.01
111 La Crosse, WI MSA	M	3870	13,466	7.2	1.56
112 Lafayette--West Lafayette, IN MSA	M	3920	16,859	4.8	0.87
113 Lake County, IL PMSA	M	3965	85,011	19.6	2.78
114 Lakeland--Winter Haven, FL MSA	S	3980	59,331	25.8	1.95
115 Lancaster, PA MSA	N	4000	56,470	11.8	1.99
116 Lansing--East Lansing, MI MSA	M	4040	74,596	16.8	-0.07
117 Laredo, TX MSA	S	4080	31,642	95.5	3.86
118 Las Vegas, NV MSA	W	4120	96,346	26.8	6.60
119 Lawrence, KS MSA	M	4150	9,792	14.4	2.62
120 Lawton, OK MSA	B	4200	22,558	34.0	0.27
121 Lexington-Fayette, KY MSA	B	4280	53,337	16.1	0.23
122 Lima, OH MSA	M	4320	29,320	12.4	-0.26
123 Lincoln, NE MSA	M	4360	29,774	6.3	1.82
124 Little Rock--North Little Rock, AR MSA	S	4400	87,065	33.0	0.39

125 Longview--Marshall, TX MSA	S	4420	34,564	30.9	0.52
126 Lorain--Elyria, OH PMSA	M	4440	48,707	19.4	-0.60
127 Los Angeles--Long Beach, CA PMSA	W	4480	1,301,780	71.1	1.56
128 Louisville, KY--IN MSA	B	4520	146,569	21.9	-0.05
129 Lubbock, TX MSA	S	4600	40,666	46.0	0.17
130 Madison, WI MSA	M	4720	49,076	8.9	2.31
131 Mansfield, OH MSA	M	4800	23,236	11.1	-0.41
132 Mcallen--Edinburg--Mission, TX MSA	S	4880	101,340	94.1	2.73
133 Medford, OR MSA	W	4890	24,061	6.0	1.82
134 Melbourne--Titusville--Palm Bay, FL MSA	S	4900	49,288	16.8	3.26
135 Merced, CA MSA	W	4940	36,140	52.2	2.87
136 Miami--Hialeah, FL PMSA	S	5000	251,740	77.3	3.01
137 Middletown, CT PMSA	N	5020	11,927	13.6	1.70
138 Midland, TX MSA	S	5040	20,758	37.7	1.70
139 Milwaukee, WI PMSA	M	5080	210,975	31.1	1.52
140 Minneapolis--St. Paul, MN--WI MSA	M	5120	362,338	11.6	1.97
141 Modesto, CA MSA	W	5170	66,324	31.9	3.05
142 Muncie, IN MSA	M	5280	17,973	10.2	-0.58
143 Muskegon, MI MSA	M	5320	30,037	22.6	0.97
144 Naples, FL MSA	S	5345	17,503	29.8	5.16
145 Nashville, TN MSA	S	5360	151,621	22.2	1.82
146 New Bedford, MA MSA	N	5400	26,377	13.5	-0.82
147 New Britain, CT PMSA	N	5440	16,931	25.0	2.71
148 New Haven--Meriden, CT MSA	N	5480	68,638	27.2	1.49
149 New London--Norwich, CT--RI MSA	N	5520	35,881	11.0	0.81
150 Norwalk, CT PMSA	N	5760	16,551	25.3	1.53
151 Oakland, CA PMSA	W	5775	293,630	44.8	1.69
152 Ocala, FL MSA	S	5790	26,261	24.2	3.39
153 Odessa, TX MSA	S	5800	25,089	44.9	0.72
154 Oklahoma City, OK MSA	B	5880	166,292	24.6	1.07
155 Olympia, WA MSA	W	5910	28,656	11.1	2.66
156 Omaha, NE--IA MSA	M	5920	103,410	16.0	1.14
157 Orlando, FL MSA	S	5960	145,743	27.9	3.96
158 Owensboro, KY MSA	B	5990	13,547	7.1	0.18
159 Oxnard--Ventura, CA PMSA	W	6000	109,219	38.5	1.45
160 Panama City, FL MSA	S	6015	21,261	18.8	1.92
161 Pawtucket--Woonsocket--Attleboro, RI–MA	N	6060	44,148	9.0	1.59
162 Pensacola, FL MSA	S	6080	52,999	26.0	2.25
163 Peoria, IL MSA	M	6120	57,131	14.5	-0.26
164 Phoenix, AZ MSA	W	6200	338,587	27.2	3.11
165 Pine Bluff, AR MSA	S	6240	17,475	54.2	-0.64
166 Pittsburgh, PA PMSA	N	6280	272,863	14.3	0.36
167 Pittsfield, MA MSA	N	6320	13,055	4.1	0.13
168 Portland, OR PMSA	W	6440	187,371	12.8	1.85
169 Providence, RI PMSA	N	6480	86,231	15.7	0.70

170 Provo--Orem, UT MSA	W	6520	63,453	4.0	1.85
171 Pueblo, CO MSA	W	6560	22,877	46.1	0.17
172 Racine, WI PMSA	M	6600	28,809	25.0	0.19
173 Raleigh--Durham, NC MSA	S	6640	102,132	36.2	3.14
174 Reading, PA MSA	N	6680	49,243	11.7	2.45
175 Redding, CA MSA	W	6690	24,721	10.9	1.84
176 Reno, NV MSA	W	6720	32,929	18.0	4.49
177 Richland--Kennewick--Pasco, WA MSA	W	6740	29,917	19.1	2.63
178 Riverside--San Bernardino, CA PMSA	W	6780	403,022	39.9	4.45
179 Rochester, MN MSA	M	6820	17,055	6.0	1.85
180 Rockford, IL MSA	M	6880	45,165	18.6	1.02
181 Sacramento, CA MSA	W	6920	225,993	30.3	2.78
182 Saginaw--Bay City--Midland, MI MSA	M	6960	72,023	23.4	-0.43
183 St. Cloud, MN MSA	M	6980	33,164	1.7	1.78
184 Salem, OR MSA	W	7080	43,787	10.8	2.17
185 Salem--Gloucester, MA PMSA	N	7090	35,435	4.3	1.00
186 Salinas--Seaside--Monterey, CA MSA	W	7120	55,066	57.3	1.68
187 Salt Lake City--Ogden, UT MSA	W	7160	247,299	8.1	1.24
188 San Angelo, TX MSA	S	7200	18,029	39.7	1.01
189 San Antonio, TX MSA	S	7240	245,688	64.5	1.26
190 San Diego, CA MSA	W	7320	351,980	42.6	2.41
191 San Francisco, CA PMSA	W	7360	163,566	57.6	0.86
192 San Jose, CA PMSA	W	7400	219,304	49.4	1.13
193 Santa Barbara--Santa Maria--Lompoc, CA	W	7480	47,825	42.1	2.64
194 Santa Cruz, CA PMSA	W	7485	33,084	34.4	1.39
195 Santa Rosa--Petaluma, CA PMSA	W	7500	56,162	16.1	2.06
196 Sarasota, FL MSA	S	7510	25,730	14.1	1.66
197 Scranton--Wilkes-Barre, PA MSA	N	7560	96,628	2.3	1.38
198 Seattle, WA PMSA	W	7600	264,408	18.0	2.52
199 Sharon, PA MSA	N	7610	19,230	8.3	0.19
200 Sheboygan, WI MSA	M	7620	17,346	6.3	1.45
201 Sherman--Denison, TX MSA	S	7640	16,879	11.6	1.12
202 Sioux City, IA--NE MSA	M	7720	20,515	8.8	0.85
203 South Bend--Mishawaka, IN MSA	M	7800	37,541	19.7	0.26
204 Spokane, WA MSA	W	7840	60,290	7.6	1.93
205 Springfield, IL MSA	M	7880	28,407	14.4	0.87
206 Springfield, MA MSA	N	8000	74,385	25.4	1.00
207 Stamford, CT PMSA	N	8040	23,391	27.6	2.04
208 State College, PA MSA	N	8050	12,626	3.9	1.31
209 Stockton, CA MSA	W	8120	85,946	48.2	2.17
210 Tacoma, WA PMSA	W	8200	95,768	19.5	2.36
211 Tallahassee, FL MSA	S	8240	32,366	50.1	1.88
212 Tampa--St. Petersburg--Clearwater, FL MSA	S	8280	244,906	23.8	2.53
213 Terre Haute, IN MSA	M	8320	21,820	6.2	-0.30
214 Texarkana, TX--Texarkana, AR MSA	S	8360	23,913	30.6	-0.20

215	Toledo, OH MSA	M	8400	97,212	21.8	0.02
216	Topeka, KS MSA	M	8440	25,694	18.7	0.47
217	Tucson, AZ MSA	W	8520	103,148	39.7	2.08
218	Tulsa, OK MSA	B	8560	123,726	23.5	1.03
219	Tyler, TX MSA	S	8640	28,197	33.7	0.57
220	Vallejo--Fairfield--Napa, CA PMSA	W	8720	67,876	36.1	2.43
221	Vancouver, WA PMSA	W	8725	42,947	8.4	3.39
222	Victoria, TX MSA	S	8750	15,019	52.7	0.41
223	Visalia--Tulare--Porterville, CA MSA	W	8780	64,071	52.7	2.58
224	Waco, TX MSA	S	8800	32,315	39.1	1.77
225	Waterbury, CT MSA	N	8880	29,709	23.6	1.90
226	Waterloo--Cedar Falls, IA MSA	M	8920	24,495	11.9	-0.49
227	Wausau, WI MSA	M	8940	17,601	4.0	1.38
228	W. Palm Beach--Boca Raton--Delray Bch, FL	S	8960	89,458	36.8	4.66
229	Wichita, KS MSA	M	9040	79,865	18.9	1.46
230	Wichita Falls, TX MSA	S	9080	21,188	26.0	0.58
231	Williamsport, PA MSA	N	9140	19,850	2.7	0.27
232	Wilmington, NC MSA	S	9200	19,192	30.9	1.31
233	Worcester, MA MSA	N	9240	62,348	11.2	1.85
234	Yakima, WA MSA	W	9260	36,279	35.4	2.64
235	York, PA MSA	N	9280	58,544	7.5	1.79
236	Youngstown--Warren, OH MSA	M	9320	82,795	18.1	-0.74
237	Yuba City, CA MSA	W	9340	22,348	30.7	2.19
238	Yuma, AZ MSA	W	9360	20,713	57.0	3.25

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Figure 1
Predicted Response of White Enrollment to Exposure Rate
(Predicted Rate by Exposure Rate, Calculated at Mean Values of Other Variables)

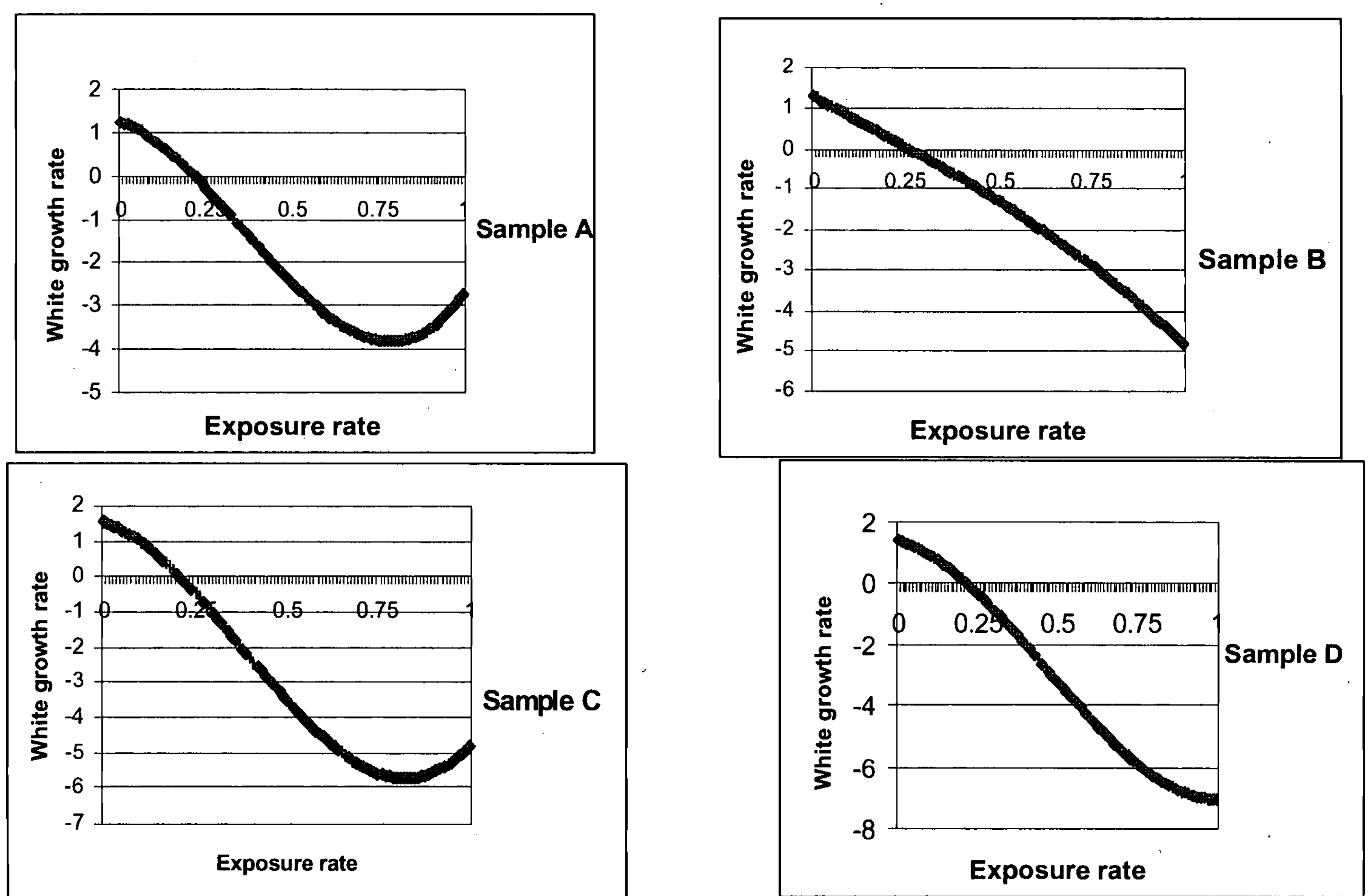
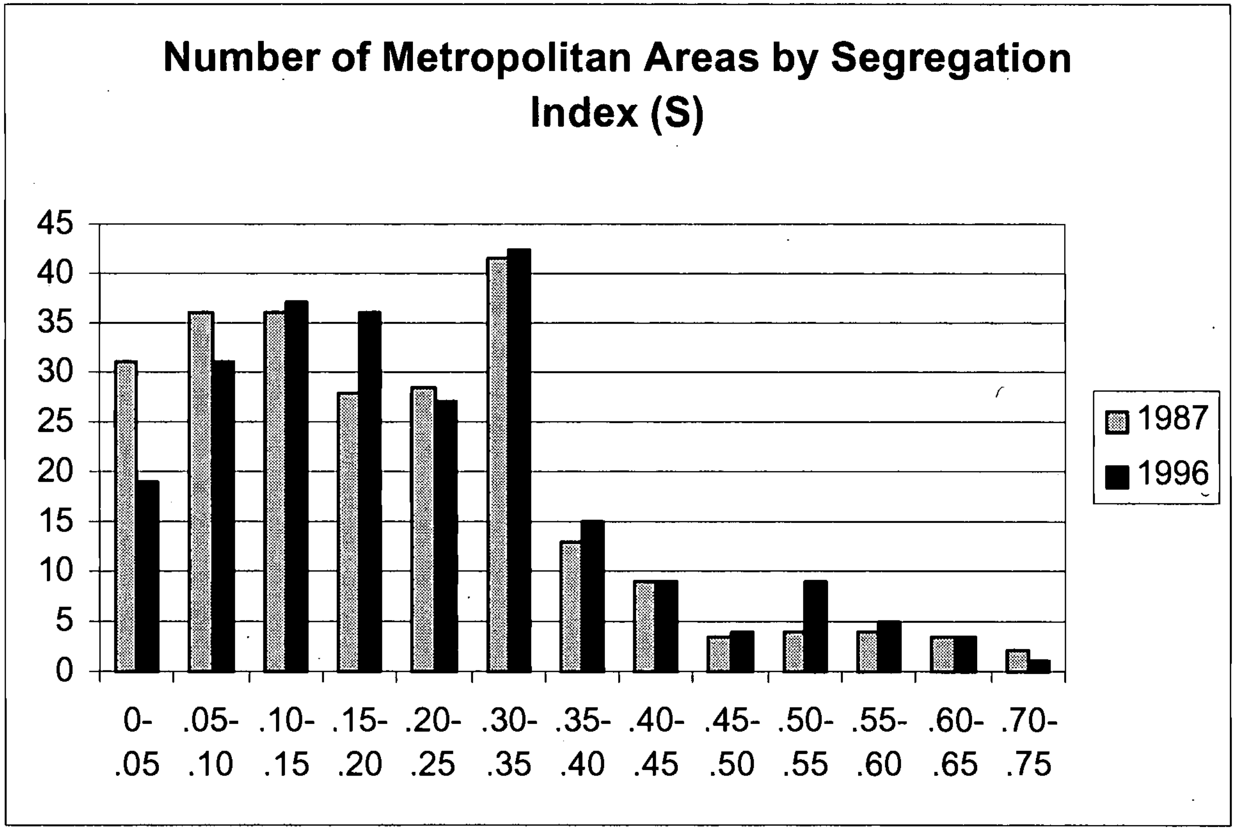


Figure 2



Note: Data ranges exclude lower bound, i.e., .10-.15 is greater than .10 and less than .15.
Source: Common Core of Data; author's calculations.

Endnotes

1. In particular, the Court in *Board of Education of Oklahoma City v. Dowell* (1991) and *Freeman v. Pitts* (1992) laid down conditions whereby districts that had been under court order could end affirmative efforts to desegregate their schools. For discussions of the legal issues, see Armor (1995, pp. 3-8, 17-58) and Orfield et al. (1997, pp. 6-7). Most recently, a federal district court in ordered the end of busing for racial desegregation in Charlotte, N.C., since the effects of past discrimination were deemed to have been eliminated (*Capacchione v. Charlotte-Mecklenberg Schools*, Nos. 3:97-CV-482-P, 3:65-CV-1974-P, 1999 WL709975 (W.D.N.C. Sept. 9, 1999).

2. For a discussion of these effects, see Braddock, Crane and McPartland (1984) or Clotfelter (1999).

3.The sample excludes special, vocational, or alternative schools, and districts operated by the state or federal government. In the terms defined in the Common Core of Data, the present sample includes type 1 (regular) schools and districts of types 1-4. In addition, two districts for which no enrollment data were reported for 1996, East Cleveland City(Ohio) and Hillsboro UHS (Oregon) were excluded.

4. The sample of districts employed in the Office for Civil Rights surveys changed over time and was based on several different criteria, including whether districts were under court order, the coverage of minority enrollments, and the ability to project sample findings to national totals. For a description of the sampling criteria, see, for example, U.S. Office for Civil Rights (1974). Studies that have employed these data include Coleman et al (1975), Orfield (1983), and Welch and Light (1987).

5. Jencks and Phillips (1998, p. 45) state, for example: "once black enrollment in a neighborhood school expands past something like 20%, most white parents become reluctant to move into the neighborhood." For references to earlier studies of this phenomenon, see Clotfelter (1976).

6. For example, between 1968 and 1972, the percentage black in the typical white child's school rose from 4 to 12 percent in Dallas, 9 to 14 percent in Little Rock, and 9 to 48 percent in Norfolk. Increases over the same period in cities outside the South were: 7 to 14 percent in Dayton, 6 to 14 percent in Denver, and 15 to 44 percent in Pasadena (Smock and Wilson 1991, Table 3).

7. As used by some researchers, this otherwise pejorative term does have a precise meaning. It is the loss of white students over and above that which would have been predicted simply on the basis of demographic factors alone.

8. For a fuller description of current patterns of school segregation, see Clotfelter (1999).

9. Following the common usage of the terms, in this paper "white" refers to non-Hispanic whites; thus "nonwhite" refers to all others.

10. These trends are illustrated by annual surveys of high school seniors done as part of the Monitoring the Future project. The percentage of white seniors who reported that they "do things (conversation, eating together, playing sports) with people of other races" increased from an average of 50 percent in 1976-78 to 65 percent in 1993-95. (The percentage for blacks stayed about the same.) The percentage of white seniors who felt it would be desirable for their "(future) children go to schools where some of the children are of other races" increased over the period from an average of 28 percent to 31 percent. Interestingly, the comparable average percentage for blacks declined, from 37 to 31 percent over the period. (Tuch, Sigelman, and MacDonald 1999), pp. 126-126, 143-144.

11. Specifically, the data were taken from Public Education Agency Universe and Public School Universe of the Common Core of Data (http:/nces.ed.gov/ccd/ and http./nces.ed.gov/surveys/SDDB/introd.html). Enrollment by racial group (American Indian, Asian or Pacific Islander, Hispanic, Black, non-Hispanic, White, non-Hispanic) was available for all schools for the academic year 1996-97. Virtually all districts reported consistent and clean data. A few did not; the sums for schools did not match the totals reported for districts. For those whose school-level data gave different sums, I based all calculations on the school-level data. Some districts reported no school-level data whatsoever; these had to be dropped.

A handful of (33) state-wide schools (such as the N.C. School of Science and Math) are listed as districts. Since they should not be considered to be part of the metropolitan areas where they are located, they were dropped from the sample.

12. Metropolitan areas covering counties in more than one state were included only if data for all constituent counties were available for both years. Because one of the missing states in 1996, New Jersey, was not missing for 1987, there were a total of 18 omitted states for the matched sample.

13. Data from the Common Core data sets for 1987-88 and 1996-97 were matched by district, and organized by county and metropolitan area. In an effort to see if there were errors in the data, printouts of schools by district were examined in detail. Growth in total enrollments by county were compared to growth in population. Where they deviated significantly or where district enrollments or numbers of schools differed greatly or where districts disappeared or appeared from the first to the second year, school names were used in matching to determine how the districts compared. In a few cases, schools in two districts were reorganized into two new districts, creating for the present sample two virtual districts, defined according to the schools each contained in 1996. Of the 875 districts with enrollments of 5,000 or more, there were 18 virtual districts created due to consolidation. Those that underwent consolidation were, on average, smaller and had lower nonwhite percentages, but there was no significant difference in the change in their segregation indices.

14. These data were available in 1987 for only 13 percent of the districts in the sample. Nevertheless, equations incorporating such income data were estimated for the reduced samples, and those results are briefly noted below in footnote 25.

15. Coleman et al. (1975) use this same measure, denoting it r. For a discussion of this measure and its relationship to measures of exposure, see Clotfelter (1978).

It may be noted that the value of S is invariant with respect to which of two groups is used as the basis for calculating the exposure rate. That is, S can be calculated using the exposure of nonwhites to whites, where W, the overall percentage of students who are white, is the maximum for this exposure rate: $S = (W - E_{NW}) / W$.

16. Welch (1987) argues that the form of the desegregation policy employed should be taken into account in assessing the impact on white enrollment patterns. Unfortunately, the size of the current sample makes a full accounting of these details infeasible. The only recognition of judicial orders in the study is the use as instruments of dummy variables for appeals court circuits and district court decisions. see text for discussion of these instruments.

17. Following Orfield and Monfort (1992, p. 2), I defined regions as follows: *South*: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia; *Border*: Delaware, District of Columbia, Kentucky, Maryland, Missouri, Oklahoma, West Virginia; *Northeast*: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont; *Midwest*: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Nebraska, North Dakota, South Dakota, Ohio, Wisconsin; *West*: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming. In the 13 cases where a metropolitan area (MSA or PMSA) had components from two regions, I classified it in the region containing the largest enrollment.

18. Tabulation based on the 975 largest districts in the current sample. 77 percent of whites could have moved to a district with an exposure rate to nonwhites of 0.20 or less.

19. Coleman et al. (1975) include a measure of inter-district segregation to reflect racial disparities, and Clotfelter (1979) included the percentage of the metropolitan area in the central city district.

20. Rather than regarding as alternative school districts those closest to a given "home" district, one might instead look at those with similar accessibility to employment, measured by the distance to a metropolitan area's central business district (CBD), reasoning that those districts are the best substitutes. This reasoning is weakened, of course, to the extent that employment is decentralized, or concentrated in more than one location. When equations were estimated substituting such a variable (looking at districts whose distance to the CBD differed by five miles or less from that of the home district rather than districts within 10 miles distance from the home district), the qualitative results were unchanged, but the overall explanatory power of the model was slightly reduced.

21. More generally, one could devise a variety of indices of accessibility using a form such as:

$$Access2 = [\Sigma_k \, (T_k/T_j)^{-r} \, (1/\,D_{jk})^{-a} \, (E_j\text{-}E_k)]^{-s} \text{, for } (E_j\text{-}E_k){>}0,$$

where r is a factor reflecting the importance of alternative enrollments, a is a constant indicating the effect of distance on the attractiveness of a particular alternative district, and s is another constant. If r = 1, the accessibility proxy rises in proportion to the enrollment of neighboring districts, as in the equation for *Access* in the text; if r = 0.5, it rises with the square root. Neither this variable nor *Access* has an exact interpretation. Their values are arbitrary, depending on the parameters a, r, and s. All that can be said about these proxy variables is that a given district will have large values for them the more a district is surrounded by close, relatively large, and predominantly white districts. In alternative regressions, not reported here, *Access2* was defined with values of 0.5 for a and s and r = 1. *Access2* is highly correlated to *Access*: the districts in which white families have the best opportunities to lessen their exposure to nonwhites tend to have higher values of both indices, although the differences are less stark with *Access2,* owing to the continuity built into it. The correlation between *Access* and *Access2* in the four samples ranges from 0.83 to 0.87. Between the two, *Access* is used because it is the simpler of the two measures, but the qualitative results are not affected by which measure is used.

22. Where L1 and L2 are the latitudes of the centroids of the ZIP codes corresponding to districts 1 and 2 and DL is the difference in longitude between those centroids, the distance between district 1 and 2, measured in degrees of arc distance, is D in the equation:

$$\text{Cos D} = (\text{Sin L1})\,(\text{Sin L2}) + (\text{Cos L1})\,(\text{Cos L2})\,(\text{Cos DL})$$

(Fitzpatrick and Modlin 1986, p.XI). The distance in miles is 69.16 D.

The use of centroids for ZIP codes of the district offices generally yields locations that are quite central to the population center of each district, but not always. An example where this approach does not work as well is Chapel Hill, N.C., for which the centroid of the district office's ZIP code (27516) lies altogether outside the district boundaries.

23. The estimates of Coleman et al. (1975) are discussed below.

24. The average segregation index in the public schools of 331 metropolitan areas in 1994 was 0.33 (Clotfelter 1999, Table 6, p. 498).

25. Based on the much smaller sample for which the necessary data were available, segregation between students receiving free and reduced price lunches from those not receiving them was similar in magnitude and likewise did not change appreciably over this period. For example, the segregation indices calculated for these smaller samples for the white/nonwhite and the no/free and reduced lunch divisions, respectively, for 1987 were: A: 0.17 and 0.17; B: 0.08 and 0.11; C: 0.03 and 0.06; D: 0.01 and 0.03.

26. Although the necessary data were available for only a small fraction of the districts, similar equations were estimated with an additional variable indicating the white exposure rate to students receiving free and reduced price lunches. In these equations, the coefficients for interracial exposure remain negative but are generally smaller in absolute value than the comparable equations using the specification of Table 6 and are statistically significant in two of the four samples. The estimated coefficient for the exposure rate to students with free and reduced lunch was negative in three of the samples and significantly so in sample D, where it was larger in absolute value than that of the racial contact variable.

27. Wright et al. (1997) make a similar argument in their study of the effect of immigration on the out-migration of the native population from metropolitan areas, pointing to metropolitan area population as an omitted variable. It seems unlikely that the omission of district or metropolitan size exerts appreciable bias in the current student. Not only does exposure have a strong and consistent estimated effect in all four samples, but in reestimates of the Coleman et al (1997) model for Sample A, the estimated coefficient of the logarithm of district enrollment was insignificant, while the variable used for exposure was negative and significant.

As a rough test of omitted effects in the current samples, data on an intermediate year, 1991, was used to regress the change in growth rates on the change in exposure rates. These equations explained little of the variance in these changes and yielded no statistically significant coefficients, a result that would be consistent with a high noise-to-signal ratio in both variables or lags in behavioral responses or both.

28. Since none of the districts in Sample C were named in a federal district court decision over this period, the corresponding dummy variable does not appear in the instrument list for that sample. In addition to these dummy variables and the included exogenous variables, the remaining instruments used in the first stage equations explaining the change in segregation were: total metropolitan enrollment, total district enrollment, each of these interacted with the regional dummy variables, and the district's share in total metropolitan enrollment share, using the 1987 values for all of these enrollment figures. The R-squares in these first stage regressions corresponding to the four samples and equations (6.5) to (6.8) were: 0.21, 0.26, 0.11, and 0.03, respectively.

29. The calculated test statistics based on the sum of squared residuals were 5.2, 0.3, 6.3, and 45.1 in the four equations. The corresponding critical value for two restrictions at the 99 percent level of confidence ranges from 4.60 to 4.75.

30.In order to compare present patterns of white withdrawal with those observed by Coleman et al. two decades earlier, a specification based as closely as possible to those employed by Coleman et al. (1975) was estimated for sample A, the sample most similar to the group of large districts analyzed in the earlier study. The racial composition and segregation variables were redefined using blacks instead of nonwhites, to conform to Coleman et al. For both change in segregation and exposure, the responses implied using the recent data in sample A are considerably smaller than those implied by the sample of largest districts in 1968-73. Those based on the sample of 46 smaller central city districts are much closer in magnitude to the estimates obtained by Coleman et al.

31. Similarly, Smock and Wilson (1991, p. 291) conclude that the loss of whites from urban districts owes more to the presence of nonwhites than to an particular events associated with desegregation.

32. As shown in Clotfelter (1999), the segregation measure S can be decomposed in the following way. Consider the hypothetical exposure rate for the metropolitan area that would occur if each district were to racially balance its schools. Just as any district's racial composition (measured by the percent nonwhite, N) represents the maximum attainable exposure rate of whites to nonwhites, the maximum exposure rate for the metropolitan area that could be achieved within the constraints imposed by the existing racial compositions of school districts this hypothetical rate. Where this hypothetical exposure rate is E*, the gap that is due to inter-district disparities between districts is $S_1 = (N - E^*)/N$. The gap due to segregation within districts is $S_2 = S - S_1 = (E^* - E)/N$, that is, the difference between the exposure rate if all districts were racially balanced and the actual exposure rate, as a proportion of the overall nonwhite proportion.

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